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(56) Documents Cited

GB 2337018 A

US 3055093 A

US 4426758 A

US 3052973 A

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INT CL⁷ **B23P 19/02, B25B 27/00**

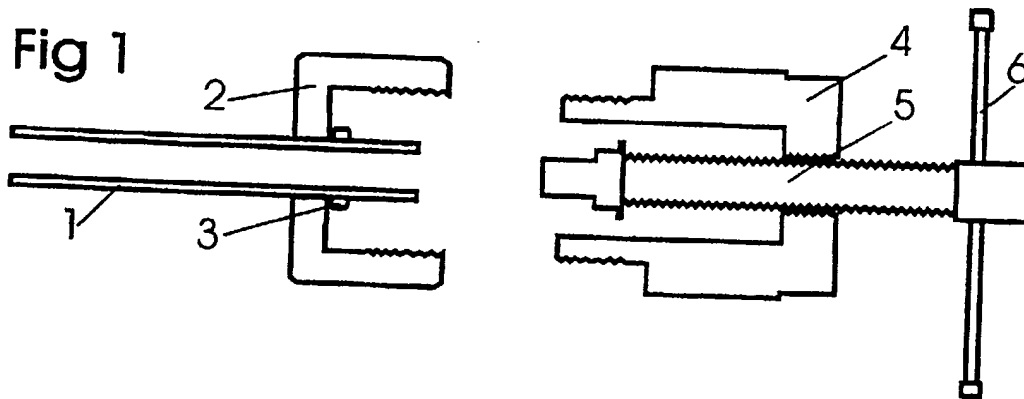
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(54) Abstract Title

Means for removing a compression ring

(57) Means for removing a compression ring 3 from a pipe 1 comprises an extractor body 4, a coupling nut 2 for attaching the extractor body to the pipes, a plunger 5 for fitment in the end of the pipe and means for effecting movement of the plunger relative to the extractor body and thereby effecting displacement of the compression ring from the pipe.

Fig 1



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Fig 1

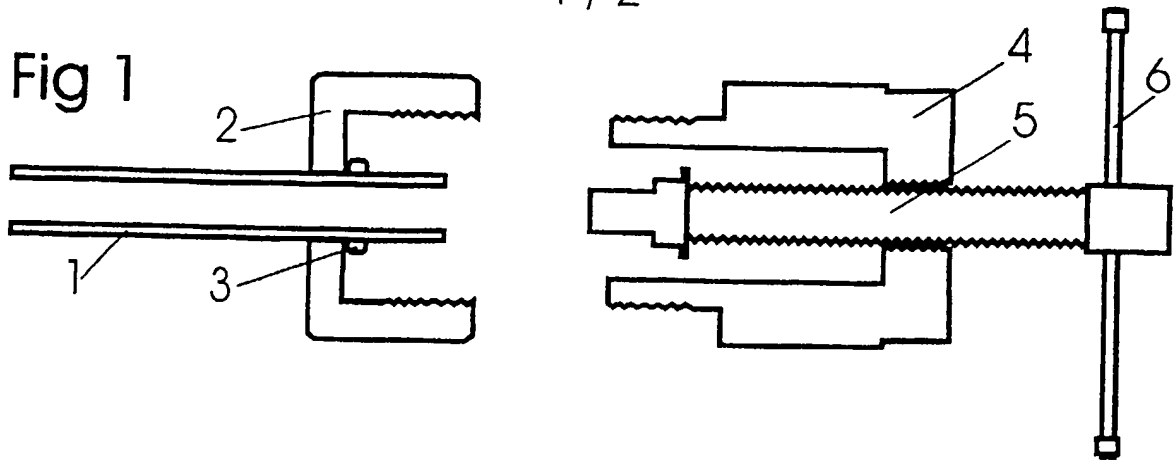


Fig 2

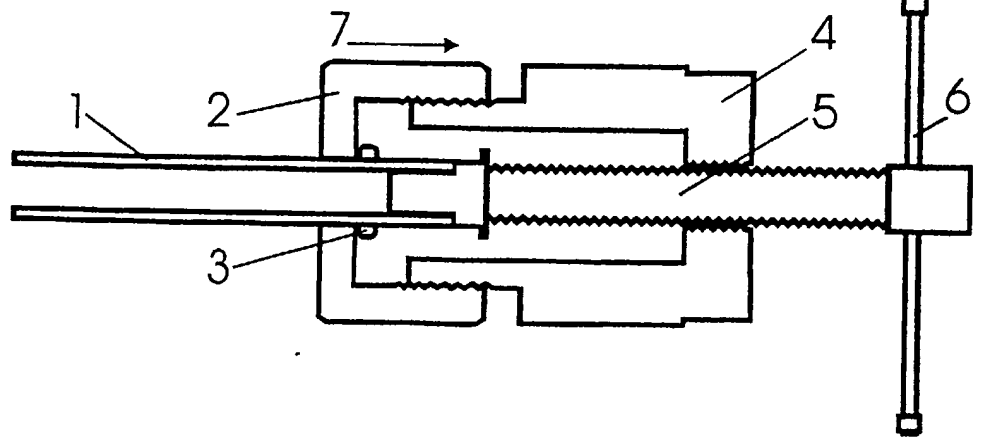


Fig 3

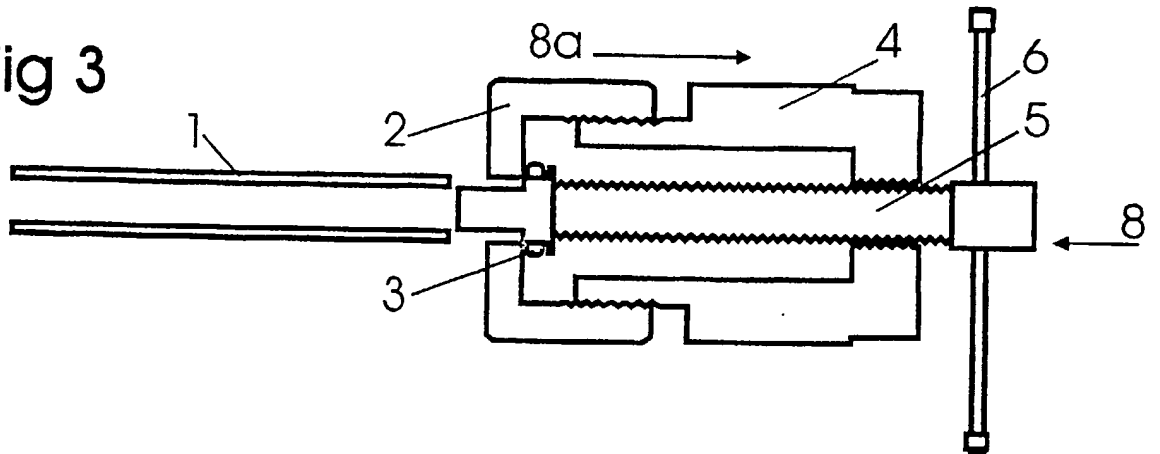


Fig 4

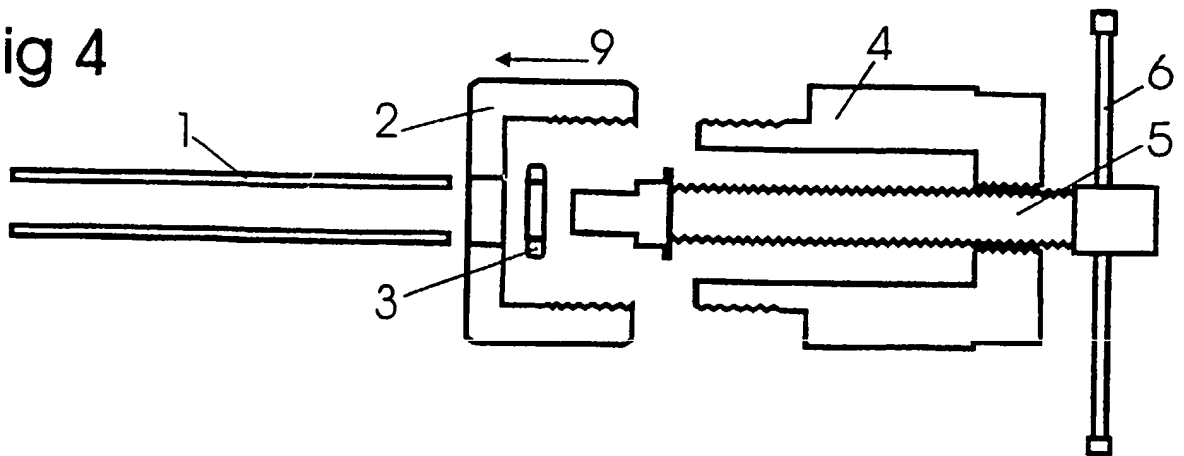


Fig 5

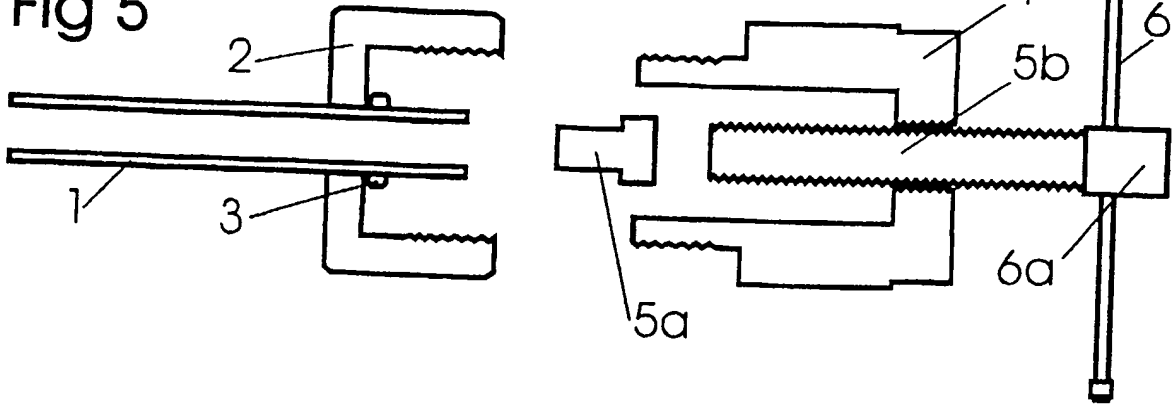


Fig 6

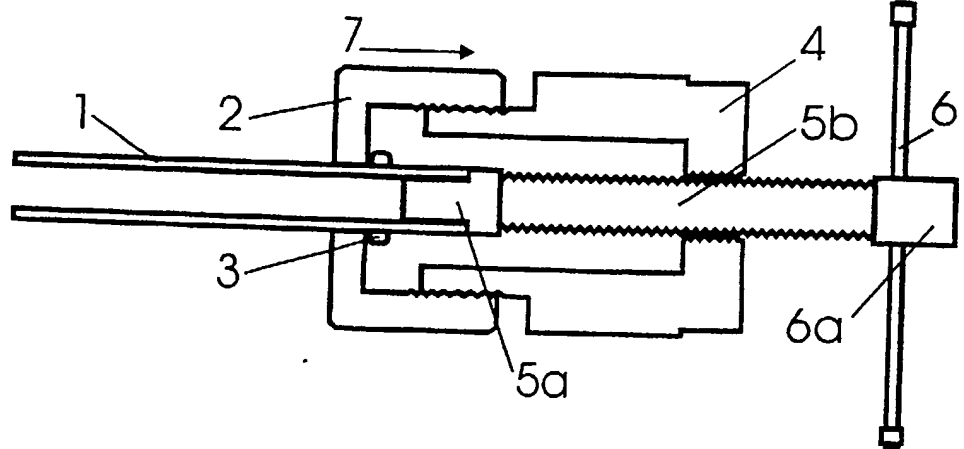


Fig 7

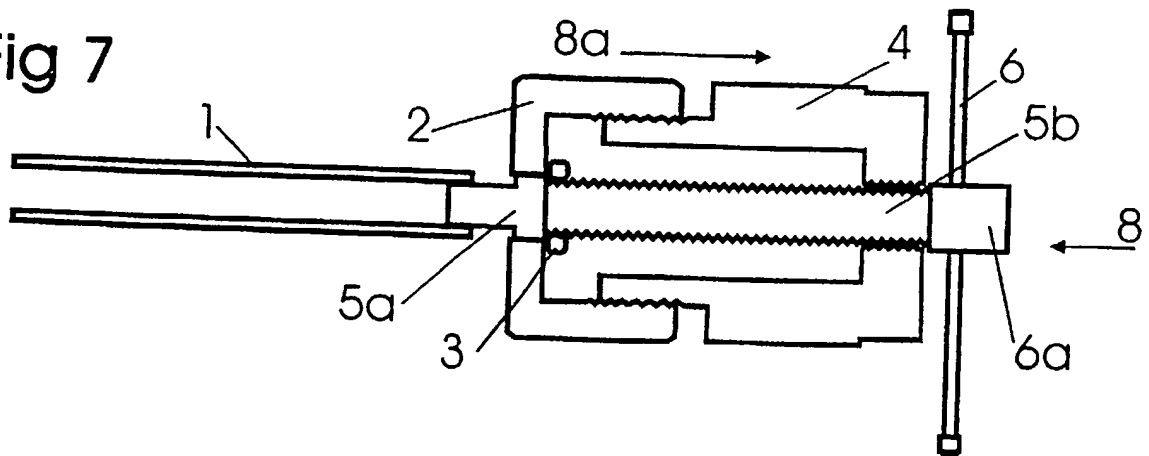
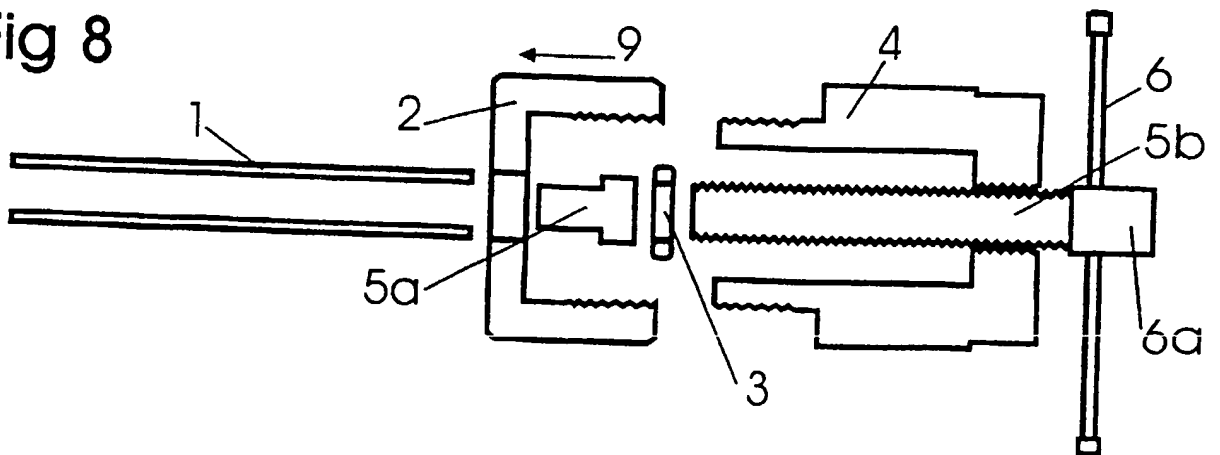


Fig 8



MEANS AND METHOD FOR REMOVING COMPRESSION
RINGS

Field of the Invention

This invention relates to means for removing compression rings from pipes and to a method of removing a compression ring from a pipe.

Compression rings are widely used in the sealing of couplings and devices to pipes. The majority of the compression rings used in, for example, plumbing, are made of copper or brass, though many other materials can be used.

The traditional method of removing a compression ring involves sawing the compression ring off the end of the pipe, with the possibility of damaging the pipe. Alternatively, the pipe is removed completely and replaced by a new pipe and fittings.

It is important to replace the compression ring with a new one before a new device is attached to the pipe, thus sealing the contents of the pipe.

It is an object of the present invention to provide improved means for the non-destructive removal of a compression ring from a pipe.

It is another object to provide an improved method for the non-destructive removal of a compression ring from a pipe.

Summary of the Invention

According to a first aspect of the present invention there is provided means for removing a compression ring from a pipe comprising an extractor body, means for attaching the extractor body to the pipe, a plunger for fitment in the end of the pipe and means for effecting movement of the plunger relative to the extractor body and thereby effecting displacement of the compression ring from the pipe.

According to a second aspect of the present invention there is provided a method of removing a compression ring from a pipe comprising providing an extractor body and a plunger, attaching the extractor body to the pipe, fitting the plunger in the end of the pipe, and effecting movement of the plunger relative to the pipe and thereby effecting displacement of the compression ring from the pipe.

Other preferred features of the invention are set out in the subsidiary claims appended hereto.

Brief Description of the Drawings

Figure 1 is a sectional view of a first form of compression ring extractor comprising a coupling nut, an extractor body and a plunger and showing the coupling nut fitted on a pipe,

Figure 2 is a sectional view of the compression ring extractor of Figure 1 showing the coupling nut connected to the extractor body prior to removal of the compression ring from the pipe,

Figure 3 is a sectional view of the compression ring extractor of Figure 1 showing the compression ring removed from the pipe but with the coupling nut still connected to the extractor body,

Figure 4 is a sectional view of the compression ring extractor of Figure 1 showing the compression ring and the coupling nut separated from the extractor body, and

Figures 5 to 8 are views corresponding to Figures 1 to 4 but showing a second form of compression ring extractor.

Description of the Preferred Embodiments

The first form of compression ring extractor shown in Figures 1 to 4 of the drawings comprises a solid, generally cylindrical extractor body 4 having an internally threaded bore and an externally threaded solid plunger 5 which engages within the bore of the extractor body 4. A handle 6 is provided at the outer end of

the threaded plunger 5 for effecting rotation thereof relative to the extractor body 4 and hence axial movement of the plunger 5 relative to the extractor body 4 in either direction. The plunger 5 has a squared-off end portion 6a so that a tool can be used for the application of extra torque to the plunger 5 should this be required.

The end of the solid plunger 5 remote from the handle 6 is so shaped and dimensioned that it can fit within the pipe 1. The part of the plunger 5 adjacent the end portion includes an area to receive the compression ring 3 (once removed from the pipe 1) and a collar for stopping the compression ring 3 from passing over the threaded section of the plunger 5.

A coupling nut 2 having a generally cylindrical internally threaded portion is fitted on the pipe 1 in abutting engagement with the compression ring 3 and the extractor body 4 has a complementary externally threaded portion at the end thereof remote from the handle 6.

In order to remove the compression ring 3 from the pipe 1:-

a) the threaded portion of the extractor body 4 is attached to the coupling nut 2 by engagement with the internally threaded portion of the coupling nut 2. In effecting such engagement, e.g. by screwing the coupling nut 2 onto the threaded end of the extractor body 4, the coupling nut 2 will be moved relative to the extractor body 4 in the direction indicated by the arrow 7 in Figure 2;

b) the threaded plunger 5 is then screwed into position within the open end of the pipe 1 by means of the handle 6, thereby moving the plunger 5 axially relative to the extractor body 4 in the direction indicated by the arrow 8 in Figure 3, until the condition shown in Figure 2 is obtained;

c) rotation of the handle 6 is then continued to effect continued movement of the plunger 5 relative to the extractor body 4 in the direction of the arrow 8 in Figure 3. Such movement of the plunger 5 relative to the extractor body 4 results in the coupling nut 2 being pulled relative to the pipe 1 in the direction indicated by the arrow 8a in Figure 3. Pulling of the coupling nut 2 relative to the pipe 1 in the direction indicated by the arrow 8a results in the compression ring 3 being pushed relative to the pipe 1 in the direction of the arrow 8a. Movement of the coupling nut 2 and the compression ring 3 is continued until they are both removed from the pipe 1 and the compression ring extractor is positioned away from the pipe 1 in the direction of the arrow 8a of Figure 3; and

d) the coupling nut 2 is then detached from the extractor body 4 by unthreading it from the extractor body 4 and thus moving it axially relative to the extractor body 4 in the direction indicated by the arrow 9 in Figure 4, thereby permitting removal of the compression ring 3 from the plunger 5.

The second form of compression ring extractor shown in Figures 5 to 8 differs from that shown in Figures 1 to 4 in that the

one-piece plunger 5 of Figures 1 to 4 is replaced by a separate plunger 5a and a threaded bar 5b.

In order to remove a compression ring 3 from a pipe 1 using the second form of compression ring extractor:-

a) the separate plunger 5a is first placed into the open end of the pipe 1 and the extractor body 4 is then attached to the coupling nut 2 by means of the external thread on the extractor body 4 which engages the internal thread of the coupling nut 2 to obtain the condition shown in Figure 6. The coupling nut 2 is thus moved relative to the extractor body 4 in the direction indicated by the arrow 7 in Figure 6;

b) the threaded bar 5b is then screwed into position mating against the separate plunger 5a by means of the handle 6, which produces axial movement of the threaded bar 5b in the direction indicated by the arrow 8 in Figure 7;

c) turning of the handle 6 is then continued, producing continued movement of the threaded bar 5b in the direction of the arrow 8, resulting in movement of the plunger 5a in the direction of the arrow 8 relative to the extractor body 4 and pulling of the coupling nut 2 in the direction of the arrow 8a relative to the pipe 1. The compression ring 3 is thus also pushed in the direction of the arrow 8a relative to the pipe 1 until the coupling nut 2 and the compression ring 3 are both removed from the pipe 1. The

compression ring extractor is then positioned away from the pipe 1 in the direction of the arrow 8a; and

d) finally, the coupling nut 2 is detached from the extractor body 4 by unthreading it from the extractor body 4 and moving it axially relative thereto in the direction indicated by the arrow 9 in Figure 8. This also releases the compression ring 3, and the separate plunger 5a, as indicated in Figure 8.

A simple and effective means is thus provided for the non-destructive removal of a compression ring from a pipe. It is also to be noted that the method of removal is such that a compression ring can be removed in less time than existing methods of removing compression rings and without risk of damaging the pipe.

Claims:-

1. Means for removing a compression ring from a pipe comprising an extractor body, means for attaching the extractor body to the pipe, a plunger for fitment in the end of the pipe and means for effecting movement of the plunger relative to the extractor body and thereby effecting displacement of the compression ring from the pipe.

2. Compression ring removal means as claimed in Claim 1, in which the means for attaching the extractor body to the pipe comprises a coupling nut.

3. Compression ring removal means as claimed in Claim 2, in which the coupling nut includes an internally threaded portion which has threaded engagement with an externally threaded portion of the extractor body.

4. Compression ring removal means as claimed in any one of the preceding claims, in which the plunger has threaded engagement with the extractor body and in which a handle is mounted on the plunger.

5. Compression ring removal means as claimed in any one of Claims 1 to 3, in which the plunger has abutting engagement with a threaded bar which has threaded engagement with the extractor body and in which a handle is mounted on the threaded bar.

6. Compression ring removal means substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

7. A method of removing a compression ring from a pipe comprising providing an extractor body and a plunger, attaching the extractor body to the pipe, fitting the plunger in the end of the pipe, and effecting movement of the plunger relative to the pipe and thereby effecting displacement of the compression ring from the pipe.

8. A method as claimed in Claim 7, which includes providing a coupling nut and attaching the extractor body to the pipe by means of the coupling nut.

9. A method as claimed in Claim 8, in which the coupling nut includes an internally threaded portion which has threaded engagement with an externally threaded portion of the extractor body.

10. A method of removing a compression ring from a pipe which includes the use of the compression ring removal means claimed in any one of Claims 1 to 6.

Claims:-

1. Compression ring removal means for removing a compression ring from a pipe, the compression ring removal means comprising an extractor body, a coupling nut for attaching the extractor body to the pipe, the coupling nut being fitted, in use, on the pipe in abutting engagement with the compression ring, a plunger for fitment in the end of the pipe and means for effecting movement of the extractor body and the coupling nut relative to the plunger and thereby effecting displacement of the compression ring from the pipe.

2. Compression ring removal means as claimed in Claim 1, in which the coupling nut includes an internally threaded portion that has threaded engagement with an externally threaded portion of the extractor body.

4. Compression ring removal means as claimed in either of the preceding claims, in which the plunger has threaded engagement with the extractor body and in which a handle is mounted on the plunger.

5. Compression ring removal means as claimed in Claim 1 or Claim 2, in which the plunger has abutting engagement with a threaded bar which has threaded engagement with the extractor body and in which a handle is mounted on the threaded bar.

5. Compression ring removal means substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

6. A method of removing a compression ring from a pipe comprising providing an extractor body, a coupling nut and a plunger, mounting the coupling nut on the pipe in abutting engagement with the compression ring, attaching the extractor body to the coupling nut, fitting the plunger in the end of the pipe, and effecting movement of the extractor body and the coupling nut relative to the plunger and thereby effecting displacement of the compression ring from the pipe.

7. A method as claimed in Claim 6, in which the coupling nut includes an internally threaded portion that has threaded engagement with an externally threaded portion of the extractor body.

8. A method of removing a compression ring from a pipe which includes the use of the compression ring removal means claimed in any one of Claims 1 to 5.



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Claims searched: 1 to 10

Examiner: Gareth Prothero
Date of search: 10 July 2002

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): B4C (C26B)

Int Cl (Ed.7): B23P 19/02; B25B 27/00, 27/06

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2337018 A (FACOM) See whole document.	1 to 5 & 7 to 10
X	US 4426758 A (CASTOE) See abstract and figs.	1, 4 & 7
X	US 3055093 A (RUBLE) See whole document.	1, 4 & 7
X	US 3052973 A (WILLIAMS) See whole document.	1, 4 & 7

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
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